

CLAIMS

1. A probe comprising:

a support; and

an intermediate excitation medium, which is fixed on

5 said support and is excited when external energy is supplied from the outside, and which causes a first molecule in the vicinity thereof having a bonding residue to achieve bonding with a bonding target which is to be bonded to said first molecule.

10 2. The probe according to Claim 1, wherein either both or one of said first molecule and said bonding target is fixed to a support member.

3. The probe according to Claim 2, wherein said support is positioned with sufficient accuracy with respect 15 to said support member so as to allow said bonding.

4. The probe according to Claim 3, wherein the accuracy is 1 nm or less.

5. The probe according to any one of Claims 1 through 20 4, wherein, when said intermediate excitation medium is excited, said intermediate excitation medium generates bonding energy which moves from said intermediate excitation medium in an excited state to said first molecule to achieve said bonding.

25 6. The probe according to Claim 5, wherein movement of said bonding energy from said intermediate excitation medium in said excited state to said first molecule is excited triplet energy transfer.

7. The probe according to any one of Claims 1 through
4, wherein, when said intermediate excitation medium is
excited, said bonding is accomplished based on electron
transfer between said intermediate excitation medium in said
5 excited state and said first molecule.

8. The probe according to any one of Claims 1 through
7, wherein said external energy is light, electrons or ions.

9. The probe according to Claim 8, wherein
said intermediate excitation medium is a
10 photosensitized molecule, and
said external energy is said light.

10. The probe according to Claim 9, wherein said
photosensitized molecule comprises a probe branch which
forms the end of said probe, and a plural number of bonding
15 branches extending radially from the tip of said probe
branch on the support side to be fixed by selective
adsorption to said support.

11. The probe according to Claim 10, wherein
said probe branch and said bonding branches have
20 different structures, and said plurality of bonding branches
branch radially from said tip of said probe branch, forming
a tree-like structure with said probe branch as a trunk.

12. The probe according to any of Claims 9 through 11,
wherein said photosensitized molecule has a dendrimer
25 structure.

13. The probe according to Claim 12, wherein said
dendrimer structure is N-[3-{3,5-bis{3,5-bis[3,5-bis(4-

mercaptobenzylthio)benzylthio]benzylthio}benzyloxy}-
propionyl-4-nitro-1-naphthylamine.

14. The probe according to any one of Claims 9 through
13, wherein said photosensitized molecule is an N-acetyl-4-
5 nitro-1-naphthylamine derivative.

15. The probe according to any one of Claims 9 through
14, wherein one molecule of said photosensitized molecule is
fixed on said support.

16. The probe according to Claim 8, wherein said
10 intermediate excitation medium is a photocatalyst and said
external energy is said light.

17. The probe according to Claim 16, wherein said
photocatalyst is titanium dioxide.

18. The probe according to any one of Claims 1 through
15 17, wherein said bonding target is a second molecule having
a bonding residue.

19. The probe according to any one of Claims 1 through
17, wherein said bonding target is a material body other
than a molecule.

20. The probe according to any one of Claims 1 through
19, wherein said intermediate excitation medium is fixed to
said support by chemical bonds.

21. The probe according to any one of Claims 1 through
20, wherein said bonding residue is an aliphatic residue
25 having an unsaturated double bond or unsaturated triple bond.

22. The probe according to any one of Claims 1 through
20, wherein said bonding residue is an aromatic residue

having an unsaturated double bond or unsaturated triple bond.

23. The probe according to Claim 22, wherein, when said aromatic residue having said unsaturated double bond is a cinnamic acid group, said intermediate excitation medium
5 is N-[3-{3,5-bis{3,5-bis[3,5-bis(4-mercaptobenzylthio)benzylthio]benzylthio}benzyloxy}-propionyl-4-nitro-1-naphthylamine.

24. A probe comprising a support; and
an interacting substance which is fixed on said support
10 and which interacts physically with a probe scanning target.

25. A probe comprising a support; and
an interacting substance which is fixed on said support
and which interacts chemically with a probe scanning target.

26. The probe according to Claim 24 or 25, wherein
15 said interacting substance is a molecule.

27. The probe according to Claim 26, wherein said
molecule comprises a probe branch that forms the end of said
probe and a plural number of bonding branches extending
radially from the tip of said probe branch on the support
20 side to be fixed by selective adsorption to said support.

28. The probe according to Claim 27, wherein said
probe branch and said bonding branches have different
structures, and the plurality of bonding branches branch
radially from said tip of said probe branch, forming a tree-
25 like structure with said probe branch as a trunk.

29. The probe according to Claim 26 or 28, wherein
said molecule has a dendrimer structure.

30. The probe according to any one of Claims 26 or 29,
wherein one molecule of said molecule is fixed on said
support.

31. The probe according to any one of Claims 24
5 through 30, wherein said probe scanning target is a molecule.

32. The probe according to Claim 24 or 25, wherein
said interactive substance is a particle having magnetism.

33. The probe according to any one of Claims 24
through 32, wherein said interacting substance is fixed to
10 said support by chemical bonds.

34. A probe comprising:
a support; and
an active molecule which is fixed so as to protrude
from said support and which acts physically on a probe
15 scanning target.

35. The probe according to Claim 34, wherein said
active molecule comprises a probe branch that forms the end
of said probe and a plural number of bonding branches
extending radially from the tip of said probe branch on the
20 support side to be fixed by selective adsorption to said
support.

36. The probe according to Claim 35, wherein said
probe branch and said bonding branches have different
structures, and said plurality of bonding branches branch
25 radially from the tip of said probe branch, forming a tree-
like structure with said probe branch as a trunk.

37. The probe according to any one of Claims 34

through 36, wherein the active molecule has a dendrimer structure.

38. The probe according to any one of Claims 34 through 37, wherein one molecule of said active molecule is
5 fixed on said support.

39. The probe according to any one of Claims 34 through 38, wherein said active molecule is fixed to said support by chemical bonds.